In the Claims:

Please amend claims 22, 23 and 24. The status of the claims is as follows:

1. (Previously Presented) An *in vivo* tomography system with high axial and lateral resolution of the human retina, comprising:

- a Michelson interferometer, producing a full-field tomography setup by interference at coherence length (OCT) with a Z scanning,
- an input light source arranged in an input arm of the interferometer,
- adaptive optical means, designed to correct wavefronts originating from the eye and directed to the eye, comprising a reference source, a deformable mirror and means of analysing the wave surface,
- means of detection, arranged in an imaging arm of the interferometer, designed to produce an image from an interferometric measurement according to the OCT principle, and
- means of adjusting the focussing of the means of analysis of the wave surface,

wherein the means of adjusting the focussing are arranged to force the deformable mirror to adopt an additional curvature, so as to conjugate the input light source and the means of detection with a point at a predetermined depth in the retina, said means of adjustment being controlled in synchronism with the Z scanning of the OCT tomography setup.

2. (Previously Presented) The system according to claim 1, characterized in that the adaptive optical means are arranged between the Michelson interferometer and the eye to be examined.

3. (Previously Presented) The system according to claim 1, further comprising means for controlling the adaptive optical means based on wavefront measurements made downstream of said adaptive optical means on a point image of the reference source produced on the retina of the eye.

4. (Previously Presented) The system according to claim 3, further including means for introducing an additional light beam, independent of the measurement beam, focussed on the retina.

5. (Previously Presented) The system according to claim 1, wherein the means of analysing the wave surface comprise an analyser of the Shack-Hartmann type.

6. (Previously Presented) The system according to claim 1, further including means for compensating for the effects of birefringence of the cornea, which are arranged in front of the eye.

7. (Previously Presented) The system according to claim 1, wherein rectilinearly polarized light passes through the two arms of the interferometer.

8. (Previously Presented) The system according to claim 7, further including a polarizing cube in order to obtain two mutually perpendicular polarizations in each arm.

9. (Previously Presented) The system according to claim 8, wherein the two arms of the interferometer comprise means for switching the polarization by 90 degrees between the outward and return legs.

10. (Previously Presented) The system according to claim 9, wherein the means for switching the polarization comprise a quarter-wave plate.

11. (Previously Presented) The system according to claim 7, wherein the interferometer is illuminated with linearly polarized light.

12. (Previously Presented) The system according to claim 7, further including means for adjusting the orientation of the input rectilinear polarization, so as to obtain a predetermined division of the fluxes injected into the two arms of the interferometer.

13. (Previously Presented) The system according to claim 6, wherein a quarter-wave plate is placed closest to the eye, before the birefringence compensation means.

14. (Previously Presented) The system according to claim 1, further including means of filtering the corneal reflection.

15. (Previously Presented) The system according to claim 14, wherein the means for filtering the corneal reflection comprise a field diaphragm arranged to diaphragm the essential component of the flux reflected by the cornea.

16. (Previously Presented) The system according to claim 1, further including means for tuning the adjustment to a given depth, through reaction of the adaptive optical means to an overall defocussing of the assembly constituted by the reference source and the analyser means.

17. (Previously Presented) The system according to claim 1, further including an active target pattern.

18. (Previously Presented) The system according to claim 1, further including means for freezing the shape of the adaptive optical means for the duration of an exposure.

19. (Previously Presented) The system according to claim 1, wherein the reference source is arranged upstream of the adaptive optical means.

20. (Previously Presented) The system according to claim 1, wherein the reference source is inserted into the optical path between the adaptive optical means and the eye to be examined.

21. (Previously Presented) The system according to claim 1, further including means for tracking the movement of the eye to be examined with the means of adjustment or detection.

22. (Currently Amended) The system according to claim 1, further including~~, in the~~a measurement arm of the Michelson interferometer, wherein in said measurment arm there is means for compensating for the effects of the focal chromatism of the eye.

23. (Currently Amended) The system according to claim 1, further including a reference arm of the Michelson interferometer, wherein in said reference arm there is means of compensating for the dispersion of the path differences.

24. (Currently Amended) An *in vivo* tomography method with high axial and lateral resolution of the human retina, comprising:

- a full-field tomography by interference with low coherence length (OCT) with a Z scanning, using an input light source,

- a production of an image of the retina by means of detection, from an interferometric measurement according to the OCT principle,

- a correction of the wavefronts originating from the eye and reaching the eye, by adaptive optical means, arranged between the interferometer and the eye, said correction comprising ~~a means of~~an analysis operation of the wave surface on the retina, and

- an adjustment of the focussing of the ~~means of~~wave surface analysis operation~~of the wave surface~~,

wherein the focussing adjustment is carried out so as to conjugate the input light source and the means of detection with a point of predetermined depth in the retina, in synchronism with the Z scanning of the OCT tomography.

25. (Previously Presented) The method according to claim 24, wherein the interferometric measurement comprises a measurement of the contrast of the fringes without modulation by the method termed Wollaston.

26. (Previously Presented) The method according to claim 24, further including a compensation for the effects of birefringence of the cornea.

27. (Previously Presented) The method according to claim 26, further including a linear polarization of the reference source and a switching of the polarization between outward and return paths.

28. (Previously Presented) The method according to claim 24, further including a filtering of the corneal reflection.

29. (Previously Presented) The method according to claim 24, further including a tuning the adjustment to a given depth, by controlling the adaptive optical means in reaction to an overall defocussing of the assembly constituted by the reference source and the wave surface analyser means.

30. (Previously Presented) The method according to claim 24, further including an adjustment of the focussing of the wave surface analyser means .

31. (Previously Presented) The method according to claim 24, further including a freezing of the shape of the adaptive optical means for the duration of an exposure.

32. (Previously Presented) The method according to claim 24, further including a compensation for the effects of the focal chromatism of the eye.

33. (Previously Presented) The method according to claim 24, further including a compensation for the dispersion of the path differences.

34. (Previously Presented) The method according to claim 24, further including a command to the wavefront analyser obliging it to work in defocussed mode.